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February 9, 2022

Marlene H. Dortch
Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: Notice of Ex Parte Presentation, Acconeer AB
ET Docket Nos. 21-48 and 21-264

Dear Ms. Dortch:

On February 7, 2022, the following representatives from Acconeer AB ("Acconeer") met with the staff of the Office of Engineering and Technology ("OET") to discuss the above captioned proceedings: Lars Lindell, CEO; Mikael Egard, COO; Fredrik Tufvesson, System Specialist; Kåre Agardh, Head of Systems Development; and the undersigned. In attendance from OET were: Jamison Prime; Michael Ha; Bahman Badipour; Nicholas Oros; Anh Wride; Damian Ariza; and Steve Jones.

Acconeer provided the attached presentation, which highlighted the differing regulatory needs of various radar technologies. Acconeer emphasized the great and growing demand by customers to use its 60 GHz sensor for use cases beyond what waivers presently allow, and asked that the FCC move quickly to adopt new rules supportive of 60 GHz radar operations.

Please direct any questions to the undersigned.

Sincerely,

/s/ Laura A. Stefani
Laura A. Stefani
Counsel to Acconeer AB

Attachment

cc: OET attendees (*via* email)

Explore the next sense

Presentation for the Office of Engi
Technology

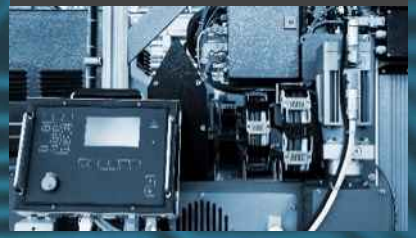
February 7, 2022

ROBOTS

CONSUMER ELECTRONICS

INTERNET OF THINGS

INDUSTRIAL & AGRICULTURE



HEALTHCARE AND FITNESS

AUTOMOTIVE

Acconeer Waiver

- Granted for four vehicular related use cases
- Limited in use cases and technical requirements as a short term solution, allowing limited automotive use cases to get to market
- Delay in adoption of new rules may lead to a need for additional waivers

Launches in the Pipeline

IOT SMART CITIES

Touchless button for pedestrian traffic light control

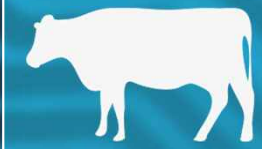
IOT SMART BUILDINGS

Presence Sanitary Bathrooms Entrance

Presence Lamp providers

INDUSTRY & AGRICULTURE

Distance detection: Farm Machinery



Distance detection: Livestock Management

Distance detection: Tank level

HEALTHCARE & FITNESS

Breathing detection Baby monitoring

CONSUMER ELECTRONICS

Gesture control Headphones

AUTOMOTIVE

Interior detection & Access control

Expected 60 GHz pulse radar use cases – near term

Table 1 *Selection of use cases addressed by SRDs in 60 GHz*

ID	Use case	Feature
A	Vehicle passenger detection	Presence detection
B	Vehicle seat belt alarm and airbag suppression	Presence detection
C	Vehicle intruder alarm	Presence detection
D	Vehicle access control	Gesture control
E	Autonomous vehicle navigation	Obstacle detection
F	Autonomous vehicle perception	Object classification
G	Infrastructure alarm system	Presence detection
H	Parking space occupancy	Object classification
I	Inventory management	Level measurement
J	Dispense control	Flow rate measurement
K	Interactive sports and gaming	Speed measurement
L	Device control	Gesture control

FCC must adopt truly technology neutral rules

- Goal: Technology neutral, future proof rules that will allow manufacturers to market a singular product worldwide
- Twenty-eight parties support this approach for pulse radar
- Technical considerations:
  - Evaluation of average EIRP
  - Duty cycle
  - Peak conducted output power
  - Additional co-existence techniques

Pulsed radar operation

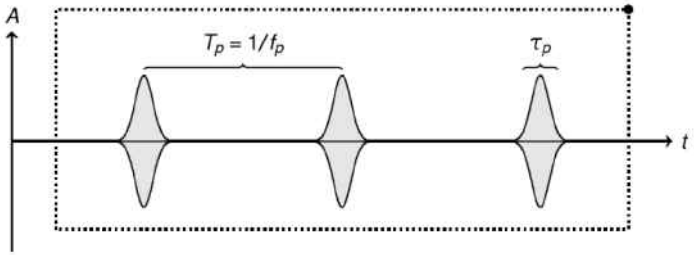


Figure 2 *Pulse radar system parameter definition*

Duty cycle = $\tau_p * f_p$

Table 2 *Parameter, symbol and range of typical value for pulse radar*

Parameter	Symbol	Typical value
Pulse length	τ_p	0.35-6 ns
Pulse repetition frequency	f_p	5-80 MHz

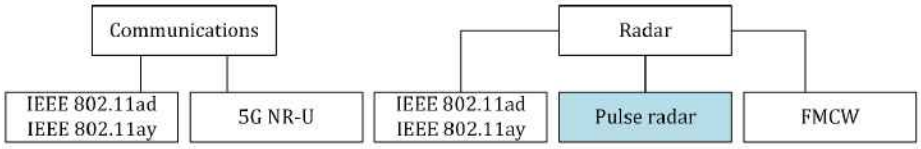


Figure 1 *Standards and technologies in the 57-71 GHz band*

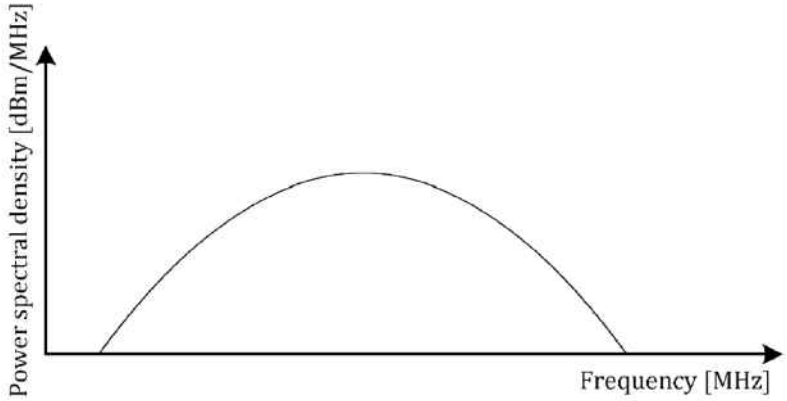
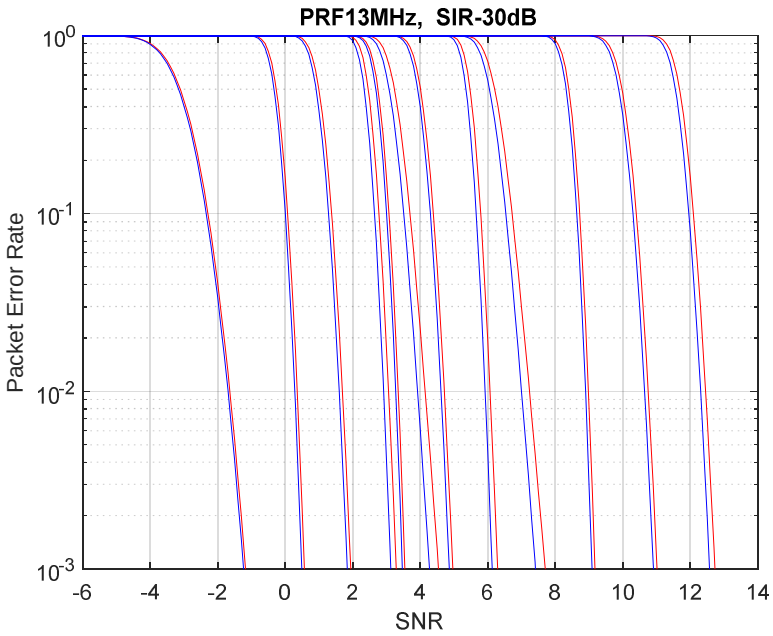


Figure 3 *Spectral density of pulse radar transmission*

Co-existence between pulse radar and 802.11ad

- The primary reasons that the potential risk of interference from pulse radar to 802.11ad/ay can be kept low are:
  - Short pulse transmission, error correction coding of 802.11ad/ay functioning even under extreme and unlikely signal to interference ratio (SIR) conditions
  - Low mean power compared to levels allowed for communication devices under 15.255



Analytical packet error rate in AWGN channel for the different MCS alternatives 1-12 for pulse repetition rate 13 MHz and with a very high interference level, SIR=-30 dB. Red curve with interference, blue curve without interference. Pulses are here 0.35 ns, i.e. shorter than the symbol time.

PULSE RADAR TO 802.11AD INTERFERENCE MEASUREMENT STUDY

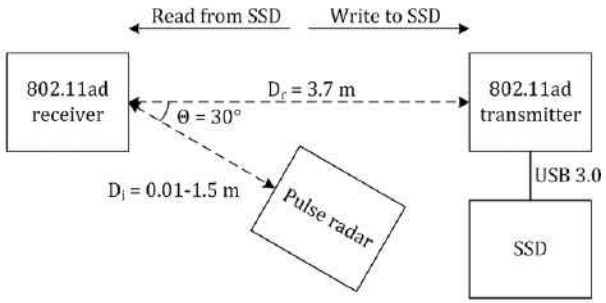


Figure 1 Measurement setup

Table 1 Technical parameters of 802.11ad equipment used in interference measurement study

Center frequency	60.48 GHz
802.11ad channel	CH2 (59.40-61.56GHz)
802.11ad transmitter EIRP	23 dBm (estimated from measurement)
TX/RX CH Bandwidth	2.16 GHz
Modulation	SC-BPSK/QPSK/16QAM (estimated from communication speed)

Table 2 Technical parameters of pulse radar used in interference measurement study

Center frequency	60.5 GHz
Pulse width	0.35, 0.8, 2.0, 3.6 ns
Peak EIRP	17 dBm
Calculated SIR at the 802.11ad receiver antenna according to setup in Figure 1, pulse radar at 0.05 m.	-31 dB + alignment factor due to the directional characteristics of the 802.11ad receive antenna

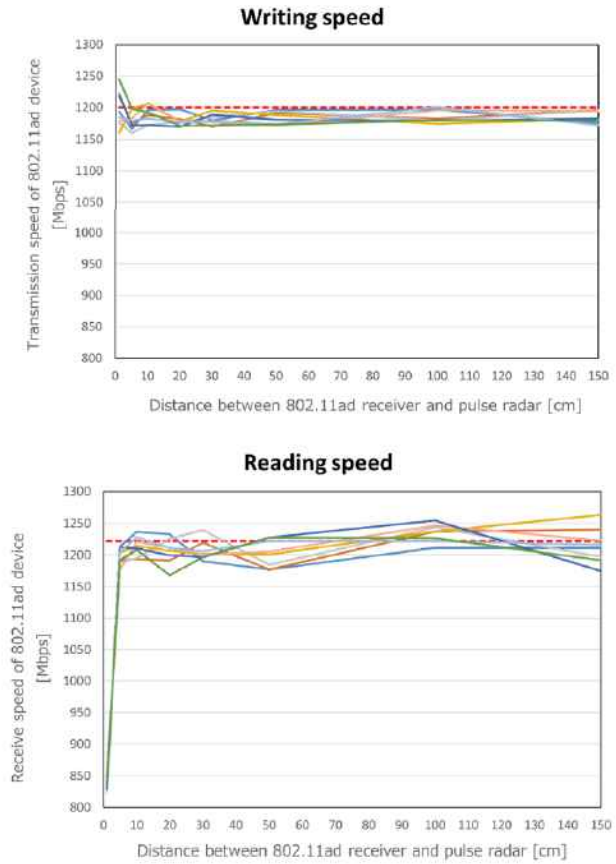


***Figure 2** Pulse radar to 802.11ad interference measurement study results. The calculated SIR at the 802.11ad receiver is -31 dB + alignment factor due to the directional characteristics of the 802.11ad receive antenna, when the pulse radar is positioned 5 cm from the 802.11ad receiver*